Contribution ID: **2050** Contribution code: **THPM067** Type: **Poster Presentation**

Production of short-lived neutron-rich beams for hadron therapy

Thursday, 11 May 2023 16:30 (2 hours)

Hadron therapy with light ion beams is gaining momentum due to the possibility to treat tumors that are resistant to chemotherapy and radiotherapy. In addition, hadron therapy is the preferred choice of treatment for tumors that are inoperable due to their vicinity to vital organs.
The main advantages of charge particle therapy compared to conventional X-ray radiotherapy are related to the possibility to target the tumor site with higher precision, both longitudinally and radially.
The high precision of the dose deposition requires also a high accuracy that is presently hindered by limited dose monitoring capabilities.
One of the approaches towards improving dose monitoring involves the use of radioactive ion beams that expose the dose distribution by the decay radiation after stopping in the tissue.
Another advantage of using specific short-lived isotopes, such as Li-8 and He-8, is the beta delayed alpha emission that is expected to increase even further the dose delivery at the tumor. He-8 has an additional feature of a single gamma emission in 84% of the decays.
There are different production schemes for radioactive ion beams based on either isotope separation on-line (ISOL), or on In-flight production and separation, or combinations of the two. The main advantages and disadvantages of the production in various scenarios will be discussed in detail. A kinematic advantage originating from the In-flight production and separation of neutron-rich beams will be presented.

Funding Agency

Footnotes

I have read and accept the Privacy Policy Statement

Yes

Primary author: TRAYKOV, Emil (Institut Pluridisciplinaire Hubert Curien)

Co-authors: ARBOR, Nicolas (Institut Pluridisciplinaire Hubert Curien); FINCK, Christian (Institut Pluridisciplinaire Hubert Curien); RAFFY, Quentin (Institut Pluridisciplinaire Hubert Curien); VANSTALLE, Marie (Institut Pluridisciplinaire Hubert Curien)

Presenter: TRAYKOV, Emil (Institut Pluridisciplinaire Hubert Curien)

Session Classification: Thursday Poster Session

Track Classification: MC8: Applications of Accelerators, Technology Transfer and Industrial Relations and Outreach: MC8.U01: Medical Applications